

Diagnostic questions to use with a Year 7 group and, when possible, with a Year 6 group.

These questions have been taken from materials produced by EPSE (Evidence-informed Practice in Science Education) as a tool to diagnose pupils' understanding about forces. More of these questions will be provided as part of the unit. There are different ways to use these questions with pupils. What is important is that the pupils understand that they are not doing a test when they complete the questions. Rather, they are being asked to show how much they know and understand about forces. Each question has several parts. Some pupils may complete all of them, others will struggle to progress past the first part of each question.

Diagnostic questions: How can I use them?

I used some of these questions right at the start of the topic, to find out where the pupils were. **Some** needed a complete recap, whereas **others** were ready to go on to new ideas.

Asking one or two of these questions at the end of a lesson or for homework is really useful – it helps the pupils to see what the key points are, and it tells you which pupils have grasped them.

Some of these questions are very good for **group work**. I got groups of three to **discuss and agree** their answer, before having a whole-class discussion.

I picked out some questions to make up a **test** at the end of the topic. It was easy to see who really understood the **key ideas**.

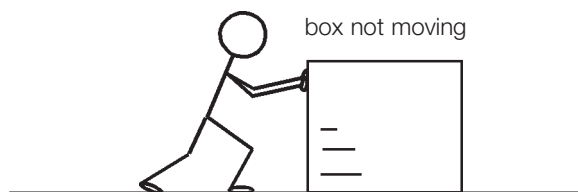
I set up some **practical tasks** round the lab. The pupils went round them in turn. They enjoyed it – and I could quickly see who understood the key ideas.

The pupils' answers showed me that I need to give more **emphasis** to some of the key ideas – and give the pupils more practice in using them.

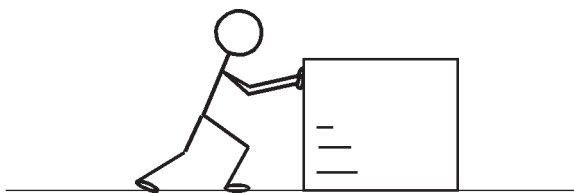
Question A

A furniture remover is pushing a heavy box to move it across the floor.

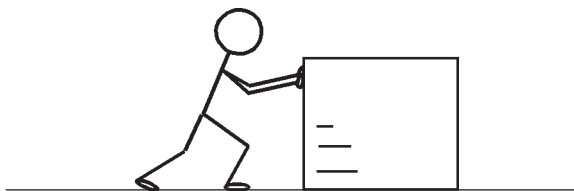
But the box is **not moving**.



- (a) On this diagram, mark with an arrow **the force exerted by the furniture remover on the box**.

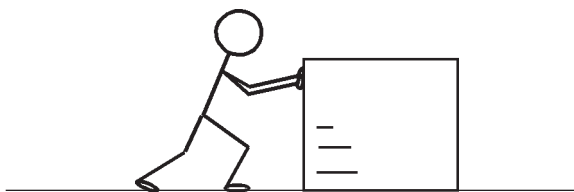


- (b) On this diagram, mark with an arrow **the force exerted by the floor on the box (the friction force on the box)**.



- (c) Is there a **force exerted by the box on the furniture remover**? _____

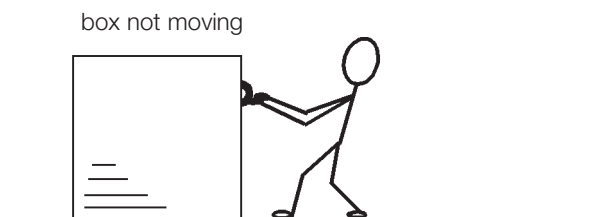
If you think there is, mark it with an arrow on the diagram below.



Question B

A construction worker is trying to pull a heavy box across the floor.

But the box is **not moving**.



- (a) On this diagram, mark with an arrow **the force exerted by the construction worker on the box**.



- (b) On this diagram, mark with an arrow **the force exerted by the floor on the box (the friction force on the box)**.



- (c) Is there a **force exerted by the box on the construction worker**? _____

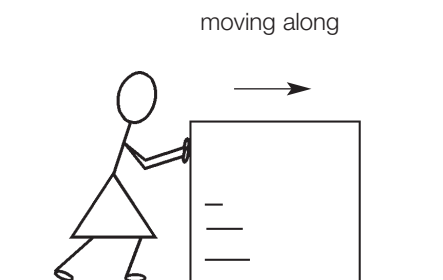
If you think there is, mark it with an arrow on the diagram below.



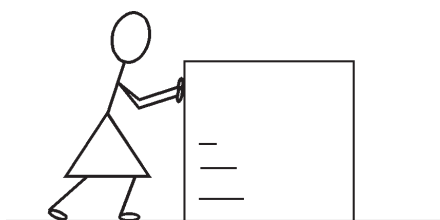
Question C

Whitney is pushing a large box across the floor.

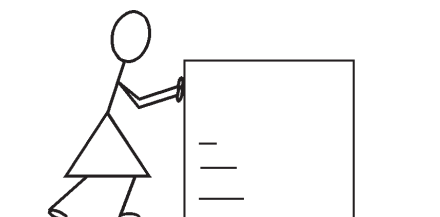
It is moving steadily.



- (a) On this diagram, mark with an arrow **the force exerted by Whitney on the box.**

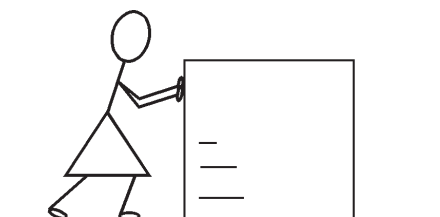


- (b) On this diagram, mark with an arrow **the force exerted by the floor on the box (the friction force on the box).**



- (c) Is there a **force exerted by the box on Whitney?** _____

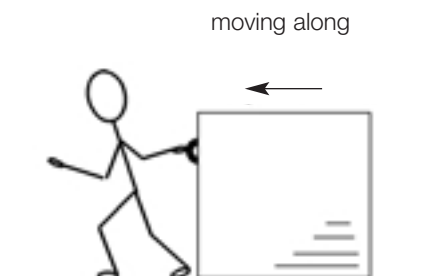
If you think there is, mark it with an arrow on the diagram below.



Question D

Ken is pulling a large box across the floor.

It is moving steadily.



- (a) On this diagram, mark with an arrow **the force exerted by Ken on the box**.



- (b) On this diagram, mark with an arrow **the force exerted by the floor on the box (the friction force on the box)**.



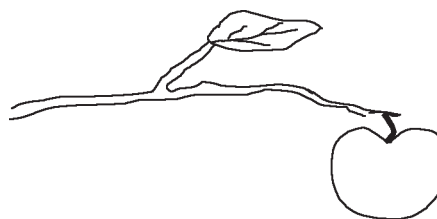
- (c) Is there a **force exerted by the box on Ken**? _____

If you think there is, mark it with an arrow on the diagram below.

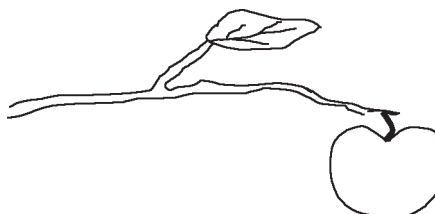


Question E

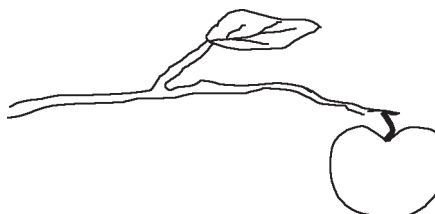
An apple is hanging on a branch.



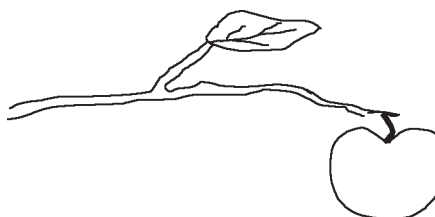
- (a) On this diagram, mark with an arrow **the force exerted by the Earth on the apple (the force of gravity).**



- (b) On this diagram, mark with an arrow **the force exerted by the branch on the apple.**



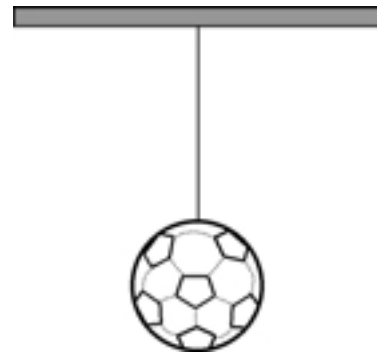
- (c) On this diagram, mark with an arrow **the force exerted by the apple on the branch.**



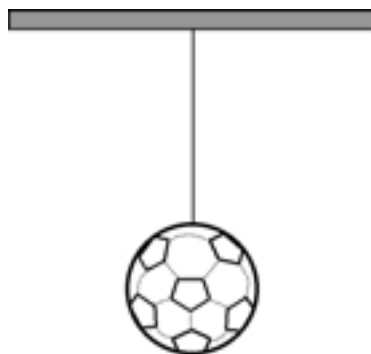
Question F

This football is hanging from a string.

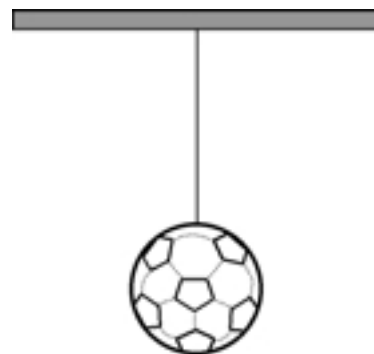
The other end of the string is tied to the ceiling.



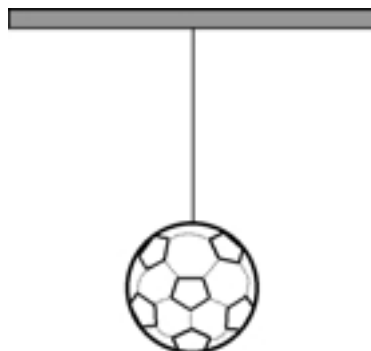
- (a) On this diagram, mark with an arrow **the force exerted by the Earth on the football (the force of gravity)**.



- (b) On this diagram, mark with an arrow **the force exerted by the string on the football**.



- (c) On this diagram, mark with an arrow **the force exerted by the football on the string**.



- (d) On this diagram, mark with an arrow **the force exerted by the string on the ceiling**.

